

Molecules of Emotion

Martin Redfern interviews Candace Pert

Interviewer: You are author of a new book *Molecules of Emotion* and have been instrumental in making a connection between molecules, chemistry and emotion. How did that start?

CP: Well that started when I was a graduate student. I among many people was looking for the receptor sites, the little keyholes where drugs like morphine, heroin and opium fit. These sites were hypothetical, then I found them and this touched off quite an explosive search for the brain's own morphine. This was finally found at the University of Aberdeen and it turned out to be a peptide which is a relatively simple chemical - this was the beginning of the peptide revolution, because the endorphins (the endogenous morphines) are found not just in the brain but throughout the entire body.

Interviewer: I think that's one of the interesting things to come out of the book, as you say, they aren't just in the brain, they are all over the place: in the immune system, in the digestive system and so on.

CP: Exactly. I was interested in studying the brain because I thought that's where the mind and consciousness was located. I think that one of the really shocking and exciting implications of the work is the fact that the molecules of emotion are found not just in every system of the body but running every system of the body, connecting every system of the body to every other system. This means that our body is really our subconscious mind.

Interviewer: So where does that leave emotions? I thought that they were something you think, you feel, that is all going on in your brain. But was it Descartes who said that anger was the blood boiling in your heart not in your brain?

CP: I didn't hear that, but that's cute. There were a lot of debates around the turn of the century in the States asking if the emotions trickle down out of your head or else originate in your body through the running of your body's equipment and machinery, subsequently working their way into the head where we then feel them. I think now the answer is really quite shocking. The emotions are happening everywhere simultaneously and it really is about learning to think of ourselves in a totally new way. Not as a machine at all but as a field of information where things travel instantaneously everywhere.

Interviewer: And you came to some of this understanding I know, sadly through your own father having lung cancer.

CP: Yes, well that was astounding synchronicity, for my father to come down with the one form of cancer which was known to be associated with peptides being secreted out of the cells of the cancer. It turns out that many tumours secrete peptides - in fact endorphins and valium peptides and the various peptides which are the molecules of emotion. It opens up all kinds of interesting research strategies for drugs that we can make that can be analogues of our internal juices, then of course there are mind/body health implications in all this.

Interviewer: So what are all these molecules of emotion, these peptides doing all over the body? They are not, presumably signalling over the long distance to the brain, so what are they doing?

CP: Well they are. They're doing different things, some are very local in their actions. Some cells, like immune cells, will secrete a peptide which will act back on itself, right on its own receptors if it's an autocrine mechanism. Some are acting at a small distance and some are acting at great distances. In fact one of the revolutions in neuroscience that I talk about in the book is the realisation that the brain is very much like a big bag of hormones. Probably less than 2% of the information in the brain is carried through synapses. The vast majority is carried by peptides and other small molecules acting at a distance - what keeps everything straight and systematic are the receptors for which they are very specific, each for its own chemical.

Interviewer: All this sounds like a blurring of the distinction between mind and body.

CP: You've got it! I mean your body doesn't exist just to carry your head around. It's truly astonishing when we realise that these receptor molecules are the place where learning occurs. This has been proven very nicely so wherever there are receptors there is memory, so some of our old patterns and our old subconscious ways of doing things are really located within our body. Trauma can be stored not just in little parts of our brain but deeply within our body, which may explain some of the very powerful aspects of the various kinds of body work.

Interviewer: It sounds as if this has implications not just for medicine but for psychology as well.

CP: Absolutely. Well psychology starts to be very primal here, it's almost like there is no physical illness that doesn't have a mental aspect and no mental illness that doesn't have a physical aspect. The mental has become the physical and the physical the mental. Of course every drug that we take, where it's to alter mood or to change our blood pressure, works by acting on a receptor that God put there to be a place to receive input from our own internal juices. Drugs cannot act unless we have internal analogues for those drugs. So this whole fine, homeostatic mechanism of our information fields is what I call the bodymind. One word, no hyphen. It's a very finely balanced system and when one starts to take external drugs one really is changing things and making it more difficult for the natural wisdom of the body to operate.

Interviewer: Perhaps changing things we don't understand well enough.

CP: Changing things we haven't discovered yet. That's the exciting thing about having been part of this endorphin revolution. I mean one minute nobody even knew anything about this stuff and then within a few short years endorphins are being invoked to explain everything from runners' high to orgasm, and everyone knows about them.

Interviewer: So what are the medical lessons to be learned from all this? It sounds as if you are warning against using drugs, at least indiscriminately.

CP: Absolutely. Many drugs have toxic side effects unlike our own internal drugs which are so selective and can act at one tiny little place in the brain or body and then instantly be dissipated by the mechanisms to get rid of them. The external drugs all need to be inactivated in the liver and you get people taking lots of different drugs, particularly elderly people. Such people can be in a very depressive toxic malaise that's really iatrogenic, caused by the very drugs that are supposed to help them. It's ironic, I'm a pharmacologist and have

become very conservative about drugs for myself and my family and really asking if they are really necessary.

Interviewer: And it's given you quite a rough ride academically hasn't it? Because whilst you've been assessing endorphin receptors and peptides produced by individual cells and so on that's reasonably safe ground in terms of main stream science, but you're linking this together into a much bigger interconnected whole with implications which some of the academics at least, haven't liked very much.

CP: It's interesting with the academics in the States, this whole mind/body interest is really taking off and the academics themselves as human beings want to feel better themselves. There is a huge switch going on. Insurance companies are running studies to see if meditation really save money, save people from going in hospital. Does diet really have an effect? People are getting positive results, things are changing rapidly. In the book, it's a cliché but I really like to talk about it as a profound paradigm shift. It's not unlike realising that the sun does not revolve around the earth, the earth revolves around the sun and we've got it all backwards. Rather than consciousness linked to spirituality as something that's out there in outer space, it's something that we can ignore, it's primal. Consciousness creates reality. The data is in. Psychological interventions in cancer, visualisation for other diseases can change the immune system, can truly change physical measurements. It's very profound. I believe that there needs to be more research and that people need to pay very close attention to it. It does seem foreign. However it must have seemed very foreign and shocking when we heard that the earth revolved around the sun. It's really of that magnitude.

Interviewer: But it must also be difficult for some of the people who have come from an alternative health direction and a spiritual direction, finding someone who's saying that actually all of this is mediated by molecules in the mind and the body and so on. You are really linking two different disciplines together here.

CP: Yes, and I think it's easier for those people. That's what's so interesting about the emotions. They are in two different realms. They are in the spiritual realm and the physical realm. They are both material and immaterial, they really are a bridge. I think that's why they are so important in therapies and that's why we must not leave emotions, mind and spirit out of medical practice.

Interviewer: That's really nice. Let me just ask you a few more questions about happiness. Well, one that sounds fairly straightforward for a start. I'm feeling pretty happy at the moment. What is actually going on in my brain and body to achieve that?

CP: Well, I know you're in love. Being in love in the normal human state it's a wonderful state, there is actually data derived from animals that bonding, close interconnections with other human beings is mediated by endorphins, where it's mother/child bonding or sibling bonding or lover/lover bonding this is an endorphinergic mechanism. And there is data showing that when the endorphins stop flowing there is a feeling of isolation and sadness.

Interviewer: So love is a chemical?

CP: You bet. It's more than one, and I have to be careful, just because I've done work on opiate receptors and endorphins. I have to keep reminding myself that that's just the tip of the iceberg. There are at least 200 other chemicals that join the brain, the glands and the

immune system, many of them peptides, that really mediate our emotions. I'm sure there are kinds of happiness and gradations of happiness and it's a very finely tuned mechanism. I think a major part of happiness is really being in balance, being in tune. A key job that the chemicals of emotion do is to help switch our body from one programme to another - we only have a finite amount of energy, what should we pay attention to? Sometimes our body needs to be digesting, sometimes it needs to be ridding itself of toxins, sometimes it needs to be watching it's not going to be hit by a car. Which I nearly was twice - they do come from the wrong side here you know! Very frightening. So thank God they have written on the ground 'Look Left -Look right'. Then there is data that hard stress can really precipitate clinical depression. Stress is really a form of information overload. When too much is happening and we are frantically trying to adjust our cells and move things before we even know where we're going. We really are in an age of information overload. A lot of stress reduction is just taking the time to be alone and be in touch with ourselves.

Interviewer: And what about the outward signs of happiness. I mean if we go around smiling or laughing. Is that actually good in itself?

CP: I think there is data that laughing is actually quite good for you. A very interesting new discovery is that laughing is actually mediated by a tiny little centre in the brain which is located way up in the front of the cortex. This is the part of the brain that is unique in humans - this is where hope is, planning, choosing. This is the part of the brain where we choose. This is very, very important. I do believe that we are hard wired for bliss. If we were hard wired for misery we would have died out 5 million years ago. I think that evolution has given us lots of things to be joyful about, it has wired up our bodies to find pleasure in all kinds of activities. So we can choose to be happy. We need to make conscious many of these negative subconscious programmes that are running. I would like to say this has been very profound for me personally and very hard to understand. Then you realise that's it's what's inside us that makes us happy, sad and not what's in the external world. In that sense the external world doesn't exist, it's really an illusion, all there is on some level is ourselves. It's our own chemicals. We can blame, oh it's my husband, he did this, It's my boss, I don't have enough money. We can create these external causes and yet we have within us the ability to choose what can make us happy, what can make us sad, by being in balance, in tune with nature, in tune with our spiritual side.

Interviewer: So all those people I commute with on the train who all look so miserable can actually carry on commuting but make a choice to be happy.

CP: They do look miserable. I was watching them go by on the London buses. People do seem to look pretty miserable lately.

Interviewer: But they have the power to go above that.

CP: Absolutely, they are being run by a belief system that says that I have to do this, I have to suffer, I believe I have to make sacrifices. We weren't designed to be that way. These are choices, conscious and subconscious choices that we are making and people really need to spend some time in meditation, in art, in hobbies and really need to get in touch with why they feel the way they feel.

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